

WHAT IS CLAIMED:

1. An infiltration apparatus, comprising:
 - a cannula;
 - a flexible tubing, connecting to one end of the cannula;
 - a peristaltic pump comprising a pathway for the flexible tubing to extend through and a plurality of non-conductive rollers installed along the pathway to direct flow direction of fluid flowing through the flexible tubing;
 - a sensor in mechanical communication with the flexible tubing or the peristaltic pump;
 - a sound generating device in electrical communication with the sensor;
 - a container, in fluid communication with the cannula via the flexible tubing extending through the peristaltic pump; and
 - a foot pedal, connected to the peristaltic pump via a flexible tube, the foot pedal being operative to control operation of the peristaltic pump by generating and delivering at least one pulse of air thereto.
2. The infiltration apparatus according to Claim 1, wherein the foot pedal under a momentary mode is operative to switch on the peristaltic pump while being depressed and switch off the peristaltic pump while being released.

3. The infiltration apparatus according to Claim 1, wherein the foot pedal under a continuous mode is operative to switch on and off the peristaltic pump by alternate depression.

4. The infiltration apparatus according to Claim 1, wherein the foot pedal under a rate control mode is operative to adjust flow rate of the fluid by controlling duration of depression applied thereto.

5. The infiltration apparatus according to Claim 4, wherein the flow rate of the fluid is proportional to the duration of depression applied to the foot pedal.

6. The infiltration apparatus according to Claim 1, wherein the peristaltic pump further comprises a rotation mechanism driving the non-conductive rollers to rotate clockwise or counterclockwise.

7. The infiltration apparatus according to Claim 6, wherein the sensor is operative to detect a rotation speed of the non-conductive rollers of the peristaltic pump when the sensor is in mechanical communication with the peristaltic pump.

8. The infiltration apparatus according to Claim 7, wherein the sound generating device is operative to generate a sound with a frequency increasing or decreasing in proportion to a rotation speed of the non-conductive rollers.

9. The infiltration apparatus according to Claim 1, wherein the sensor is operative to detect a flow rate of a liquid flowing through

the flexible tube when the sensor is in mechanical communication with the flexible tubing.

10. The infiltration apparatus according to Claim 9, wherein the sound generating device is operative to generate a sequence of sound with a frequency variable with the flow rate.

11. The infiltration apparatus according to Claim 1, wherein the sound generating device is operative to generate a sequence of beeping sounds in response to an output of the sensor.

12. An infiltration apparatus, comprising:

a cannula;

a flexible tubing, connecting to the cannula;

an infiltration pump comprising a pathway for the flexible tubing to extend through and a plurality of rollers installed along the pathway to exert force on the flexible tubing;

a sensor in mechanical communication with the flexible tubing or the infiltration pump;

a sound generating device in electrical communication with the sensor;

a container, connecting to the flexible tubing extending through the peristaltic pump; and

a foot pedal, operative to activate/inactivate the infiltration pump in response to depression performed thereon in a plurality of modes, wherein the modes comprise:

a first mode, under which the infiltration pump is activated when the foot pedal is depressed, and switched off when the foot pedal is released;

a second mode, under which the infiltration pump is switched and remain on and off by alternate depressions performed thereon; and

a third mode, under which operating speed of the infiltration pump is proportional to duration of depression performed on the foot pedal.

13. The infiltration apparatus according to Claim 11, wherein the sensor is operative to detect the force exerted by the rollers and output an electrical signal to activate the sound generating device in response to the force.

14. The infiltration apparatus according to Claim 13, wherein the sound generating device is operative to generate a beeping sound with a frequency determined by the force.

15. An infiltration pump, comprising:

a headstock, which comprises:

a pathway; and

a plurality of insulated rollers installed along the pathway;

a sensor in mechanical communication with the pathway or the rollers; and

a sound generating device in electrical or mechanical communication with the sensor.

16. The infiltration pump according to Claim 15 wherein the headstock further comprises a rotation mechanism operative to drive the insulated rollers rotating clockwise or counterclockwise.

17. The infiltration pump according to Claim 15 further comprising an electric motor operative to drive the rotation mechanism to rotate.

18. The infiltration pump according to Claim 15, wherein the sensor is operative to detect a rotation speed of the rollers and generate an electric signal in response to the rotation speed.

19. The infiltration pump according to Claim 15, wherein the sensor includes a flow sensor operative to detect a flow rate of a fluid flowing through the pathway.

20. The infiltration pump according to Claim 15, wherein the sound generating device is operative to receive the electric signal and generate a sound with a frequency in response to the electric signal.

21. The infiltration pump according to Claim 20, wherein the sound generating device is operative to generate a sequence of beeps in accordance to the rotation speed or the flow rate.

22. An infiltration pump for fluid infiltration, comprising:
a headstock, which comprises:

a pathway;

a plurality of rollers installed along the pathway, the rollers being fabricated from electrically non-conductive materials; and
a rotation mechanism operative to actuate rotation of the rollers along a predetermined direction.

23. The infiltration pump according to Claim 22, further comprising a motor to drive the rotation mechanism.

24. The infiltration pump according to Claim 22, further comprising a flexible tubing extending through the pathway, wherein the flexible tubing is in contact with the rollers.

25. The infiltration pump according to Claim 22, further comprising a switch operative to control rotation of the rollers.

26. The infiltration pump according to Claim 22, further comprising a foot pedal operative to control rotation of the rollers.

27. The infiltration pump according to Claim 22, further comprising a sensor to detect rotation condition of the rollers.

28. The infiltration pump according to Claim 22, further comprising a sound generating device operative to generate a sound signal having a frequency proportional to rotation speed of the rollers.